FOREWORD

Once again, it is a pleasure to be able to reflect on the accomplishments of the NIST Center for Neutron Research over the past year. The reactor shim control arms were replaced during a planned shutdown early in 2000. As a result, the reactor was scheduled to operate for 212 days during the reporting period, and did operate 198 days, or 93 % of the scheduled time, as a consequence of one unplanned maintenance shutdown. Construction was begun on the new cooling tower which will not only provide needed capability for the next 25 years, but will also reduce the plume visibility during cold weather. The cold source availability for the period was 98 %; i.e., the cold source held the reactor from operation 4 days during the year. The second-generation liquid hydrogen cold source passed all required pressure tests, and the final assembly is now being prepared for insertion into the reactor in 2001. Finally, steady progress has been made in preparing for a license renewal application to the Nuclear Regulatory Commission, in order to extend the period of operation beyond 2004.

Three high-resolution inelastic scattering instruments, the High Flux Backscattering Spectrometer, the Disk Chopper time-of-flight Spectrometer, and the Neutron Spin Echo spectrometer (highlighted in the 1999 report), are now being offered to users who can tolerate the quirks inherent in getting a new instrument on-line. USANS, the perfect crystal small angle scattering spectrometer (part of the NSF/NIST CHRNS), is installed at the reactor and available for proposals; the first phase of the high intensity Filter Analyzer Neutron Spectrometer is operating with high intensity and good backgrounds; and the design and manufacture of new thermal neutron spectrometers is underway. (USANS, DCS, and FANS are highlighted in this report.) This simultaneous development program has put severe strains on our resources, but we can now look forward to many years of benefit from the results. During the past year, a proposal was made to the National Science Foundation (NSF) to allow joint NIST/NSF operation of the three high-resolution instruments, and to construct a new cold neutron triple axis spectrometer. The final disposition of this application is not yet available, but the external reviews are complete, a site visit has taken place, and the NSF is now considering the appropriate action. If this proposal is funded, then we will be able to operate these new inelastic scattering instruments properly in a full user mode.

Finally, as always, the results are seen in the output of the researchers who use the facility. As has become our practice, we are presenting highlights of this work in the following chapters of this report. I think that all can agree that the results truly speak for themselves.